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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/653,222

09/03/2003

Jin Li

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07/07/2005

DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP

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EXAMINER

ORTIZ, EDGARDO

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 07/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/653,222

Applicant(s)

LI, JIN

Examiner

Edgardo Ortiz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) 1-17, 31 and 32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18-30 and 33-46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 9/3/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of claims 18-23, 25-30, 33, 36-43 and 46 in the reply filed on April 21, 2005 is acknowledged. The traversal is on the ground(s) that some of the claims that readable on the elected species (Species III) are generic to Species IV (Fig. 5) and Species V (Figs. 10 and 11). This is found persuasive and thus claims 18-30 and 33-46 will be examined as follows.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 18-22, 26-30, 34, 35, 37, 40-43 and 46 are rejected under 35 U.S.C. 102(b) as being anticipated by Ogawa (U.S. Patent No. 6,104,021). With regard to Claim 1, Ogawa discloses on figures 3 and 4 a photosensor (31) at a surface of a substrate (36), a microlens over said photosensor (31), said microlens comprising a first light transmissive layer (38) having an output surface and a receiving surface, the receiving surface having a concavity therein (38a), and a second light transmissive layer (32) in the concavity having an input surface and a transmitting surface that meets the receiving surface at a boundary (column 6, lines 15-19) and readout circuitry (33) that provides signals from the photosensor (column 5, lines 36-51).

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With regard to Claim 19, Ogawa discloses an area of the microlens that is greater than an area of the photosensor (see figures 3 and 4).

With regard to Claim 20, Ogawa discloses a microlens that is centered over the photosensor (31). See figures 3 and 4.

With regard to Claim 21, Ogawa discloses a substrate (36) having a plurality of photosensitive regions (31) and a microlens array formed over said plurality of photosensitive regions (31), said microlens array comprising, a first light conductor (38) having a plurality of recesses (38a) and a second light conductor (32) within each recess (38a) and over said first light conductor (38). See figure 4.

With regard to Claim 22, Ogawa discloses a first light conductor (38) that is located proximally to a photosensitive region (31), and a second light conductor (32) located peripherally from said photosensitive region (31). See figure 4.

With regard to Claim 26, Ogawa discloses a plurality of concave recesses (38a) that have an elongated shape. See figure 4.

With regard to Claim 27, Ogawa discloses a substrate (36) having a plurality of photosensitive regions (31) and a microlens array formed over said plurality of photosensitive regions (31), said microlens array comprising, a first light conductor (38) having a plurality of recesses (38a) and a

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second light conductor (32) within each recess and over said first light conductor (38) and readout circuitry (33) that provides signals from the photosensitive region (column 5, lines 36-51). See figure 4.

With regard to Claim 28, Ogawa discloses a processor (33) and an imaging device coupled to said processor (33) and comprising an imaging array containing a plurality of photosensitive regions (31) provided in a substrate (36) and a microlens formed over each of the plurality of photosensitive regions, each microlens comprising, a first light conductor (38) having at least one concave recess (38a) and a second light conductor (32) within at least said recess. See figure 4.

With regard to Claim 29, Ogawa discloses a topmost surface of said first light conductor (38) that is planar to a topmost of said second light conductor (32). See column 6, lines 11-14 and figure 4.

With regard to Claim 30, Ogawa discloses a first light conductor (38) having a first index of refraction and a second light conductor (32) having a second refractive index that is different from said first index of refraction (column 6, lines 8-10).

With regard to Claim 33, Ogawa discloses providing a substrate (36) having a plurality of photosensitive regions (31) and forming an array of microlenses including a respective microlens over each of said plurality of photosensitive regions (31) by, forming a first light conductor (38)

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having at least one concave recess (38a) over each of the photosensitive regions (31) and forming a second light conductor (32) within each of said at least one recess. See figure 4.

With regard to Claims 34 and 35, Ogawa discloses planarizing a topmost surface of said first light conductor (38) in order to be planar to a topmost of a second light conductor (32). See column 6, lines 11-14 and figure 4.

With regard to Claim 37, Ogawa discloses a first light conductor (38) having a first index of refraction and a second light conductor (32) having a second refractive index that is different from said first index of refraction (column 6, lines 8-10).

With regard to Claims 40 and 41, Ogawa discloses a concave recess formed by chemical etching and ion etching the first light conductor (38). See column 7, lines 43-58.

With regard to Claim 42, Ogawa discloses providing a substrate (36) having a plurality of photosensitive regions (31) and forming an array of microlenses including a respective microlens over each of said plurality of photosensitive regions (31) by, forming a first light conductor (38) having at least one concave recess (38a) over each of the photosensitive regions (31) and forming a second light conductor (32) within each of said at least one recess and forming readout circuitry (33) that provides signals from the photosensitive region (31). See column 5, lines 36-51 and see figure 4.

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With regard to Claim 43, Ogawa discloses providing a substrate (36) having a plurality of photosensitive regions (31) and forming an array of microlenses including a respective microlens over each of said plurality of photosensitive regions (31) by, forming a first light conductor (38) having at least one concave recess (38a) over each of the photosensitive regions (31) and forming a second light conductor (32) within each of said at least one recess and over said first light conductor (38). See figure 4.

With regard to Claim 46, Ogawa discloses a plurality of concave recesses (38a) that have an elongated shape. See figure 4.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 24, 25, 44 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa (U.S. Patent No. 6,104,021) in view of Ray (U.S. Patent No. 5,701,008). With regard to Claims 24, 25, 44 and 45, Ogawa essentially discloses the claimed invention but fails to disclose the claimed concave recesses that contact are coextensive with each other. However, Ray discloses a microlens array including a plurality of microlenses (12) that contact and are coextensive with each other (see figure 4). Therefore, it would have been obvious to someone with ordinary skill in the art, at the time of the invention, to modify the structure and method

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disclosed by Ogawa to include the claimed concave recesses that contact are coextensive with each other, as suggested by Ray, in order to provide microlenses which can be etched using a single step, thus reducing process steps (column 4, lines 1-4).

4. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa (U.S. Patent No. 6,104,021) in view of Applicant's admitted prior art as disclosed on figure 1 and its description of pages 1-4 of then instant application. Ogawa essentially discloses the claimed invention but fails to disclose the claimed step of forming a color filter between the substrate and a second light conductor. However, Applicant's admitted prior art discloses forming a color filter comprising (22a, 22b, 22c) that is placed between a substrate that contains photosensors (24a, 24b, 24c) and microlenses (12a, 12b, 12c). Therefore, it would have been obvious to someone with ordinary skill in the art, at the time of the invention, to modify the structure and method disclosed by Ogawa to include the claimed step of forming a color filter between the substrate and a second light conductor, as suggested by Applicant's admitted prior art, in order to allow predominantly light of a specific respective color to pass through an imaging array (page 3, lines 1-5 of the instant application).

5. Claims 38 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa (U.S. Patent No. 6,104,021) in view of Kochi et al. (U.S. Patent No. 6,188,094). Ogawa essentially discloses the claimed invention but fails to disclose the claimed materials of the first and second light conductors. However, Kochi discloses a solid-state image pickup device including microlenses (17) formed on a transparent polymer resin layer (16). Therefore, it would



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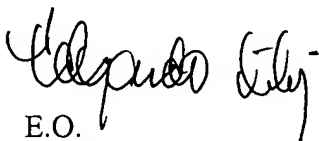
have been obvious to someone with ordinary skill in the art, at the time of the invention, to modify the structure and method disclosed by Ogawa to include the claimed materials of the first and second light conductors, as suggested by Kochi, in order to provide conductor comprising a material which can have a low refraction index and protects microlenses (column 5, lines 18-24).

***Conclusion***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edgardo Ortiz whose telephone number is 571-272-1735. The examiner can normally be reached on Monday-Friday (1st Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 571-272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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A.U. 2815  
6/30/05



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PRIMARY EXAMINER**